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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/045,746 | 10/26/2001 | Mamiko Miyanaga | SOEI/0013 | 9682 |

32588 7590 06/21/2005

APPLIED MATERIALS, INC.
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SANTA CLARA, CA 95050

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| EXAMINER |
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STINSON, FRANKIE L

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| ART UNIT | PAPER NUMBER |
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1746

DATE MAILED: 06/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/045,746

Applicant(s)

MIYANAGA ET AL.

Examiner

FRANKIE L. STINSON

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 May 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

1. In view of the remarks filed May 25, 2005, the Final Rejection dated March 25, 2005 in favor of the following Office Action.

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mori et al. (U. S. Pat. No. 6,673,262) in view of Shang et al. (U. S. Pat. No. 5,788,778).

Re claim 1, Mori is cited disclosing a cleaning method for a vapor phase deposition apparatus (see col. 2, lines 11-16 and col. 3, line 59 through col. 4, line 3) for forming film (tungsten, silicon, see col.3, lines 31-40) onto a substrate by introducing film forming gas into a chamber (the remote excitation chamber see col. 4, line 9), comprising:

activating a cleaning gas including a compound containing fluorine atoms by exposure to microwaves (see col. 3, lines 49-52 and col. 4, lines 3-11) and then

introducing the cleaning gas into a chamber (the reactor) where a cleaning temperature (see claim 7) is greater than the film forming temperature (500°C, see col. 7, "Example 46"), that differs from the claim only in the specific recitation of the apparatus having a showerhead and the step of the showerhead being raised to a temperature greater than the temperature of the showerhead during film formation. It is understood by the examiner that the apparatus as described in the specification in Mori

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is a conventional Chemical Vapor Deposition (CVD) device similar to that as disclosed in the Shang reference. Where Shang discloses a showerhead (12) located in a deposition chamber (10), a remote excitation chamber (46) where cleaning gas having fluorine atoms (see col. 6, lines 12-32) is excited by microwave energy and then introduced into the processor/reactor. Therefore, it is believed to be obvious to one having ordinary skill in the art, to modify the method of Mori, to employ the same in an apparatus as taught by Shang, since the apparatus is deemed to be conventional as describe the Mori reference. As for the showerhead being raised to a temperature greater, during reactor/chamber cleaning, than the temperature during film formation, please note in Shang, where the film formation is carried out at a temperature of 500°C. The excited cleaning gas has a temperature of 10°C-700°C. Thusly, when the cleaning gas is in the range 500°C-700°C, the showerhead would inherently transfer the greater temperature to the showerhead. Re claims 5 and 7, Shang discloses the temperature as claimed.

4. Claims 2-4 rejected under 35 U.S.C. 103(a) as being unpatentable over the applied prior as applied to claim 1 above, and further in view of Matsuse et al. (U. S. Pat. No. 5,647,945).

Claims 2-4 define over the applied prior art only in the recitation of restriction of a cooling medium and the heater in the showerhead, for the purpose of raising the temperature of the showerhead. Matsuse is cited disclosing the raising of the temperature by restriction the flow of cooling medium ("COOLING WATER" as at 125, see fig. 6) and further discloses the heater (124). It therefore would have been obvious

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to one having ordinary skill in the art to modify the method/process of Mori, to include a cooler/heater as taught by Matsuse. In the art various devices have been employed to either heat or cool, to employ one over another is merely a design choice since they are essentially the functional equivalent of each other (see MPEP 2144.06 SUBSTITUTING EQUIVALENTS KNOWN FOR THE SAME PURPOSE).

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. In Satoh et al., Brabant et al., Chung et al., and Raaijmakers et al., note the chamber cleaning gases and cleaning/film formation temperatures.

6. Applicant's arguments with respect to claims 1-6 have been considered but are moot in view of the new ground(s) of rejection.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to FRANKIE L. STINSON whose telephone number is (572) 272-1308. The examiner can normally be reached on M-F from 5:30 am to 2:00 pm and some Saturdays from approximately 5:30 am to 11:30 am.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr, can be reached on (571) 272-1700. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

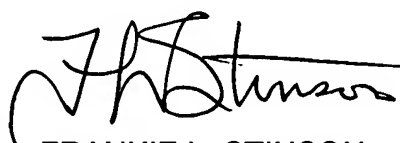
Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

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For more information about the PAIR system, see <http://pair-direct.uspto.gov>.

Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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A handwritten signature in black ink, appearing to read "Frankie L. Stinson". The signature is stylized with a large, looped "F" and a long horizontal stroke at the end.

FRANKIE L. STINSON
Primary Examiner
GROUP ART UNIT 1746